MONTHLY JOURNAL OF
THE MUSHROOM GROWERS'
ASSOCIATION

MGA BULLETIN

APRIL, 1956 · NUMBER 76

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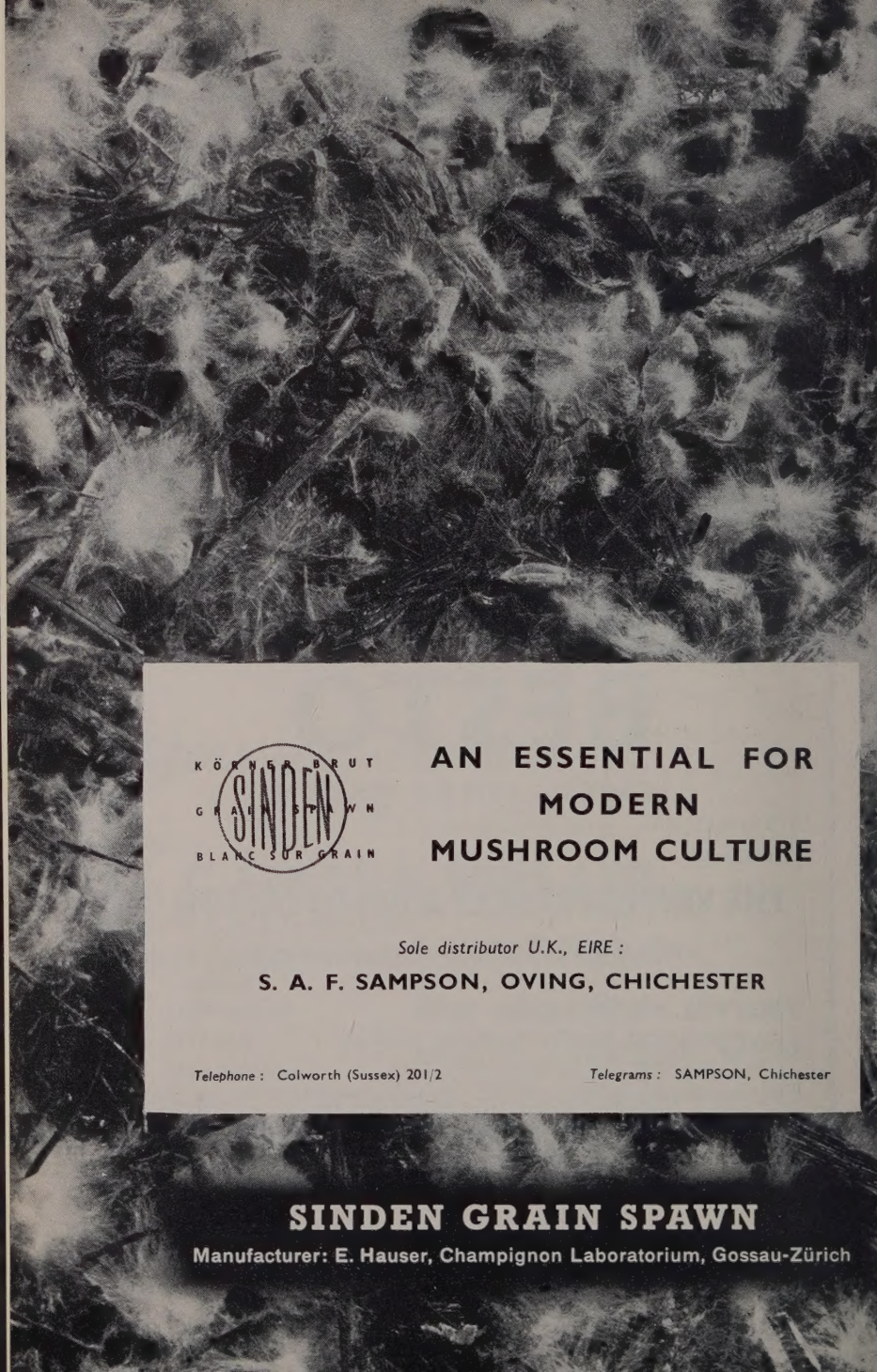

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EDITORIAL

For a very long time now Publicity has taken pride of place in the affairs of the MGA and it is as well perhaps if the brake was lightly applied as a reminder that, in spite of the importance of publicity, there are other things within the mushroom industry which demand attention.

One of them is the question of increased membership. It has long been realised that, whilst there is little doubt that the MGA does, in fact, represent the majority of growers in this country, there are still too many commercial growers who remain outside the organisation.

By growers we mean those to whom mushroom growing is at least an important part of their activities if not their main occupation. It does not refer to those who occasionally purchase a carton of spawn to grow mushrooms for their own consumption. *It is in confusing the two that much misconception may well have arisen as to the real strength of the MGA.* It is of course realised that there are many by whom mushrooms are grown as more or less a catch crop, who are not members and yet grow on a commercial scale and it is these, along with the full time commercial growers who remain outside, to which this membership drive is to be directed.

Already steps have been taken to obtain the names and addresses of such growers but if all existing members would furnish the MGA Secretary with the names and addresses of growers who, known to them, are not members, the task of bringing the activities of this organisation to their attention would be much simplified.

In any organisation numbers mean strength and it is to be hoped therefore that since increased membership is in the interests of all concerned, the required information will be forthcoming.

This then is one of the matters which, although certainly not overlooked by the MGA Executive Committee, have been thrust into the background by Publicity. It is time, along with other matters, that it was allowed to emerge. It is gratifying to learn therefore that a proposal is to be put forward to appoint a membership sub-committee to go fully into the matter. W.R.A.

(*Photograph by courtesy of W. Darlington & Sons Ltd.*)
MUSHROOMS AFFECTED BY FUSARIUM ON THE RIGHT

Fred. C. Atkins reminds us of . . . . . .

FUSARIUM AND "DAMPING OFF"

Probably one of the most frightening experiences in mushroom growing is to have a house die on one's hands, as it were: a fine crop wiped out within a few days. In 1934 we would have said it was a case of Damping Off. In 1942 we might have blamed it on to Mummy. In 1950 it could have been attributed to La France.

Before another span of eight years passes, *i.e.*, before yet another ogre appears in 1958, it might be worthwhile to carry a stage further the re-assessment of these troubles which I began in *MGA Bulletin* 74, published in February of this year. Let us look again at what F. C. Wood (6, 7) had to say about Damping Off caused by *Fusarium* spp.:

1. Typically the effect is that mushrooms make their appearance and for a time seem perfectly healthy even to maturity. When picked, however, they show a pithy withered nature and the interior of the stalk is generally brown, the discoloration showing a gradation in intensity from the base of the stalk to the cap. Mushrooms of this type appear in patches among and in close proximity to healthy breaks.

2. If they are picked off, healthy ones may be produced for a time. Eventually, however, the trouble reappears—generally having spread down the beds—and now there is a distinct external difference from the healthy crop.

3. The third stage shows a diminution in size from the normal and, furthermore, a characteristic lopsidedness is noticeable, the stalk being eccentrically placed instead of centrally in relation to the cap.

4. This leads to the last stage in which the mushroom never grows beyond the button stage, in which it becomes mummified and persists on the bed for as long as a month without rotting.

5. In two cases investigated, the crop was characterized by very long stems, small caps, discoloured flesh and extremely rapid rotting and decomposition.

Wood noticed that, where Damping Off took place *at the start of cropping*, it was invariably associated with:

(*a*) A heavy clay soil which had been finely screened. This soil coheres on watering, and the temperature of the house causes it to dry into a hard crust through which air cannot penetrate, thus adversely affecting the growth of the mushroom mycelium.

(*b*) Lack of ventilation.

The first published criticism, I believe, came in Cheshunt's 1937 Report, in which Williams (5) reported the failure of " an attempt to reproduce the disease by inoculating the casing soil with a culture of a Fusarium." This single attempt, I suggest, should be contrasted with Wood's " many unsuccessful efforts." Williams went on to say: " It may be noted that Wood was unable to obtain infection under similar conditions "; whereas he did in fact succeed " by spraying the casing soil with a spore suspension."

Wood " pressed " moist pure-culture spawn into his troughs before casing. Williams altered the verb to " compressed " and added: " It may be suggested that these conditions of growth rendered the mushrooms more susceptible to attack by the fungi and that the primary cause of the trouble under nursery conditions is to be found in conditions of the bed which are unfavourable to the mushroom." Yet he made no attempt to explain why the control trough, into which spawn had been similarly pressed, produced no Damping Off symptoms.

Much more damaging was the pronouncement by Kligman and Penny (2) that " there is yet no positive evidence, at least in America," that the presence of Fusarium in casing soil caused the injury described by Wood. The " yet " and " at least in America " should be noted; they have been overlooked by most subsequent writers.

How did Kligman and Penny reach their opinion? They " packed " pure-culture spawn into troughs following Wood's technique. The troughs were then cased with infested soil. No diseased mushrooms appeared. This seems to dispose of Williams's theory; but it does not help Wood's case when the Americans go on to report that " on many occasions mushroom beds were infested heavily at the beginning, middle and end of the crop. Both temperature and humidity were varied. In no case was infection detected."

It is not surprising that they concluded that the poor ventilation and the panning of the casing soil referred to by Wood might themselves be responsible for the damage, particularly as " Fusarium species are extremely widespread and may frequently be isolated from normal casing soil." What this conclusion overlooks, however, is the inexorable spread of the symptoms along the bed, as if from a centre of infection.

Damping Off, whatever its cause, used to be very prevalent before the War, and in a discussion with Wood some years ago I was assured that, in over 90% of the cases he investigated, a *Fusarium* sp. had been isolated from the base of the affected mushroom, or in close proximity to it, had been grown in pure culture and then positively identified by Dr. Wollenweber, the authority at that time. This association of Damping Off with *Fusarium* would appear to be too marked to be dismissed as purely coincidental.

It should also be remembered that Wood has demonstrated a marked antagonism between the mycelia of *Fusarium* spp. and *Psalliota hortensis*. He cased a number of samples of pure-culture mushroom spawn with soils inoculated with different *Fusarium* spp., and " in every case the *Fusarium* mycelium spread rapidly through the soil until it met the upward-growing mushroom mycelium. This latter then ceased growth and became quiescent for some weeks and senescent in the more extreme cases. Moreover, a definite line of demarcation became visible, after a few weeks, at the junction of the spawn and the casing soil, the mycelium in this region tending to rot and form a deep brownish layer. The rest of the spawn underlying this area assumed a reddish tint." This antagonism, as far as I know, has not been questioned.

One of the reasons why we hear so little about " Fusarium Disease " in the mushroom industry nowadays may well be that isolation for growth in pure culture is a long process requiring more time than advisers can normally devote to it. " The separation and identification of the numerous fungi in the soil is really a lengthy piece of work, and it is for this reason that this particular disease of mushrooms could not be explained for such a long time; and it shows why, even now, the symptoms alone are used for diagnosis," wrote Ware (4) in 1945.

No longer are the symptoms sufficient, however. Some have since been attributed by Kligman and Penny to Mummy Disease, and others are very similar to those seen by Sinden and others at the farm of the La France Brothers. And while it is not my object to champion Wood's theory, the fact should not be overlooked that the carefully documented evidence he supplied in his *Phytopathology* papers has not been refuted, and European scientists of the calibre of Bewley (1), Ware and Treschow (3) accepted his conclusions.

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THIS BULLETIN—LATE

The late arrival of this Bulletin is due to the illness of the Editor who apologises to members and subscribers as well as advertisers, for any inconvenience which may have been caused.

PRE-PACKING PAYS PROFITS

By MAJOR A. L. A. DREDGE, M.B.E.
Combe Bank Market Gardens

Since we entered the mushroom industry a couple of years ago, we have always been very interested in the project of pre-packing mushrooms.

In July last year we staged an exhibit of growing mushrooms at the Sevenoaks Horticultural Society's Annual Show and gave a prominent place to pre-packed mushrooms in cartons supplied by Eburite Corrugated Containers Ltd., of Park Royal Road, London, N.W. 10.

The public of Sevenoaks, who had not seen this form of packing previously, were very interested and wished to purchase the mushrooms at the Show. We followed this up by supplying local shops with a few during the next week, but the retailers were not very enthusiastic because of the additional price.

Major Dredge getting the pre-packs ready for dispatch

The next stage was to interest Covent Garden salesmen and a Director and the Chief Salesman of Messrs. Broome & Green spent a morning at our farm studying details of pre-packing. After this visit it was decided to give the proposal a trial at Covent Garden.

We had been warned by several growers that it was a difficult task as, on the whole, greengrocers were not keen on pre-packs on account of the additional cost. In fact we were told that when the project was tried out some years ago by another grower, who had spent a lot of time and trouble arranging for pre-packed mushrooms to be sent to the market, the scheme fizzled out in a farce. They were all bought by a Chinaman, tipped into a sack, and carted off to a ship bound for Shanghai! This warning, however, did not deter us; we ordered 10,000 cartons and 1,000 trays and started to supply Covent Garden just before Christmas.

The first consignment was a roaring success and fetched 6/- per lb. Since then we have been sending moderate supplies regularly and find that the price averages 1/- per lb. above the other " opens " packed in the orthodox manner in 2½ lb. chip baskets.

Several large London stores were originally interested in our pre-packs and Selfridges, Harrods and Whiteleys are now regular buyers.

We realize that the pre-pack is in its infancy but as labour becomes increasingly difficult we feel certain that more and more shops and particularly self-service stores will include pre-pack mushrooms as a regular item on their counters.

So far as the economic position is concerned, we should explain that pre-packs, in material alone, cost 6d. per lb. more than the normal packing charges. It is difficult to assess the exact extra labour involved in packing as with a little practice, our staff have become extremely quick, but it undoubtedly does take a little longer since the mushrooms are graded; this is off-set to some extent by reduction in freight charges.

So far as handling is concerned, the van drivers prefer the pre-pack trays, which contain 5 lb., and we are told that they reach Covent Garden in perfect condition.

. . . and how they looked at Covent Garden next morning. By 7 a.m. only two trays remained.

Since we ourselves only produce 1,200 lb. per week and have to meet local commitments of some 400 lb. per week in the various neighbouring towns and villages, we obviously cannot " corner the market " in this method of sales, and we hope that other mushroom growers will join in our scheme, which is proving profitable, and start sending similar cartons, preferably with some form of MGA stamp. Incidentally, we also find this an admirable method for publicity since we enclose a " Don't Peel " slip in each carton and also a few Recipes and " Winning Ways " in the trays, thus ensuring that they actually reach the consumer and are not put in the waste paper basket or used to wrap carrots by the greengrocers!

If other growers are interested, we shall be only too happy to answer queries, or show them our methods if they care to visit the farm.

MUSHROOM INDUSTRY EXHIBITION, EASTBOURNE 1956

For the Annual Mushroom Industry Exhibition at Eastbourne, on 14th and 15th November the headquarters of the MGA will be at The Grand Hotel, where accommodation for the Executive Committee has already been reserved. Among other activities a full scale dinner-dance has been arranged at this hotel. MGA members should make their own reservations. Total all-in charges vary from 45/- to 55/- per day. Full details of the programme will be published next month.

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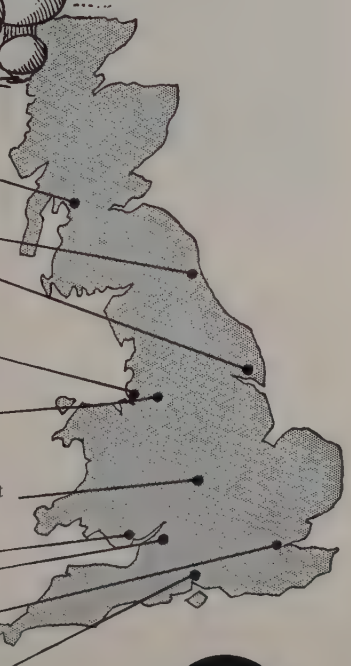

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LANCASHIRE FARM WALK

Representation on an area basis to membership of the MGA Executive Committee was forecast by Mr. G. W. Baker, MGA Chairman, when he presided over a meeting following a farm walk organised by the Lancashire, Cheshire and North Wales Area Committee.

The farm visit was by kind permission of Messrs. James Martland Ltd., of Burscough Bridge, and Mr. Royce Martland conducted the party on visits to three of the firm's farms. About seventy people came and nearly sixty sat down to tea at Ormskirk.

The discussion which followed tea covered a wide variety of questions and Dr. Peet (Messrs. Geo. Monro Ltd.) said that in his opinion Cecids were the greatest potential threat to mushroom growing to-day. There was, he agreed, no real cure and, with a serious attack the best thing to do was to clear the house right out, thoroughly clean and fumigate, and start again. Salt and nicotine in the water acted as a deterrent to this pest. The salt did no harm to the mushroom and, he suggested, this deterrent was not used by growers as often as they might. He advised two ozs. nicotine plus 1 lb. salt in 10 gallons of water.

Another question dealt with creosote and Mr. T. Orritt said he had for some years applied creosote to his trays but before using he mixed three parts creosote to one part tractor vapourising oil. It was applied through a fine spray with 35 lb. pressure. He had found this method of mixing and application quite satisfactory in every way.

Before the gathering disbanded thanks were expressed to Messrs. Martland, to Mr. Royce Martland and to the organising committee.

PINHEADS

72. One grower displays an intelligence above the average when he suggests the motto of every mushroom grower should be " I don't *understand;* I just *don't* understand."

73. We've had cecid larvae on and off for many years, but never as bad as during the last 12 months. It must be 10 or 12 years, however, since we saw a cecid *fly*. A week or two ago we removed some sideboards from a growing crop and dipped them in a very strong cresylic acid solution and replaced them. The idea was to see if we could kill off some of the larvae. Within two or three days the bed where these boards had been treated was full of cecid *flies*. There were no flies in any other house then or since. Pure coincidence? Or a clue to treatment?

74. A year or two ago a late Foreign Secretary was reported to be relaxing in a small holiday district hotel. A friend and I decided to have a look at him. This friend was of a different political colour from the late F.S., and was constrained after a couple of drinks to ask the house, in clear tones, " Who gave away the Persian oil?" The late F.S. shrank behind his pint and was seen no more. At this moment I feel rather like my friend, except that I'm quite sober, when I ask, " Who were the people who plugged the Tray System in this country? Who are the people who are still plugging it? Who are the people who benefit most by plugging it? Ordinary growers? Or is the ordinary grower a mere pawn in a financial game?"

75. Mushroom growing, like modern life, has developed into a mad, hurtling, hectic rush. Speed and efficiency, born of greed and nurtured by personal prestige, are the worshipped gods. This lesson was rammed home after we started up our new boiler. We are no less greedy and egotistical than any other grower, but we do sometimes have our nostalgic moment. It was different in the old days when we were unmenaced by pseudo-science, when a mushroom cultivator was a *grower* and not an efficiency-doped, machine-age slave. Take our boilers as an illustration of the change. Once upon a time we shovelled a few lumps of coke into a sometimes co-operative, sometimes reluctant miniature boiler, which occasionally provided heat for a primitive mushroom house (carefully avoiding cold nights!) and we settled down to the evening book well content in the knowledge that in a two-minute job we had done all possible. We had a peaceful happy mind. Mushrooms grew, without reason, in conditions that wouldn't be tolerated for a moment now. But what to-day? A highly efficient, expensive, (even explosive!) costly-to-run boiler is fully automatic. Science has solved all problems; theory is crowned King. You press a switch and all is well, except that before you can settle down to your book and a cosy fireside (nostalgia again!) you must check innumerable valves, water levels, float switches, steam traps, strainers, inspection glasses, steam pressures, water feed pumps, water gauges, oil feeds, tracer lines, flow mains, condensate returns, leaking joints, photo-electric " no flame " switches, flame settings, heat motor switches, air controls, oil

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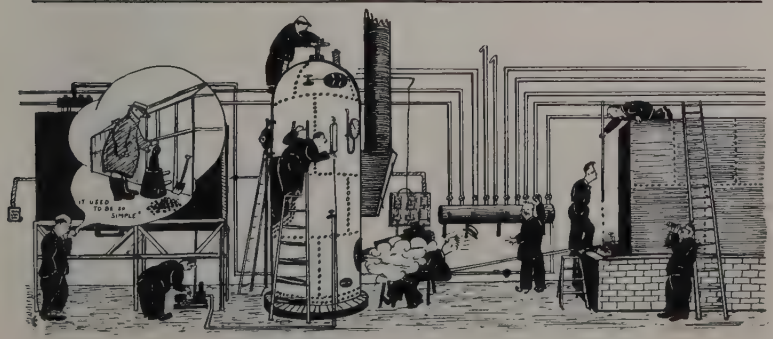
levels, primary air gaps, spark gaps, and so on. But just you dare to open that book or stir that dying ember and, as you live, a warning bell will ring and you start the round of inspection again. You sleep no more. Do mushrooms grow any better for it? I doubt it. In those days of primitive heat, primitive compost, primitive spawn (did I say *those* days?), primitive knowledge, we were primitively happy. We'd no right to be happy, of course; but if you want to see the epitome of despair and worry, gaze upon the furrowed brow of any mushroom grower in 1956. It all used to be so simple.

76. This letter appeared in the *Times* of 6th March.

Dear Sir, I am constantly amazed and irritated by the efforts of restaurant proprietors to raise the status of the cultivated mushroom from a pleasant ingredient of a grilled dish to an expensive rarity. This week I find I can purchase a mushroom for 3½d. and a tomato for 2¼d. At a provincial restaurant the other day I ordered " fillet steak garni " which consisted of a generous helping of good meat, one half a tomato and one mushroom. I was informed that two additional grilled tomatoes would cost 9d. but two more mushrooms would cost 2s. 6d. Are we being fair to mushrooms—or tomatoes? I am not, Sir, a mushroom grower.

77. During composting on a frosty or cool morning, forks, and forkfuls of compost, are flung around quite inaccurately and with much abandon when vision is impaired by a stack puffing out vast clouds of steam. I wonder how many promising lads have been pronged to death on these occasions.

78. The producer tells me I'm not allowed to advertise on this programme, but I think I must point out that I am only temporarily joining the ranks of the Tray pluggers of Pinhead 74. While I am unspeakably happy to be free of the tedium and turmoil of the System, I feel it my duty (to myself) to do my bit by encouraging at least one grower to extend his tray farm. You, Sir, you're doing very well on trays? You wouldn't dream of shelves? How right you are. Stick to trays; stick in the mud; " stick " but do not " twist." You can't do better. You're where you ought to be; you're where we want you. And we want to help you stay there. You should increase your area; you should grow more small mushrooms; " May all your worries be little ones." You need more trays—we have them. You need more excellent



" It used to be so simple "—see 75.

labour-saving roller-conveyors—we have them. See our Small Advert. page in this Bulletin and help one happy shelf grower to complete his celebrations.

79. It appears to be true that the amount likely to be spent on buildings and equipment for Mushroom Research at Littlehampton is no more than the amount to be spent on a sports pavilion at an Essex School. I've nothing against games pavilions for the cultivation of the sporting spirit among the men of to-morrow, but it does seem to me there is a perceptible lack of that spirit to-day when an industry second only to tomatoes isn't given a sporting chance in Research.

80. In a footnote to Pinhead 64 the Editor was of course quite right. " Now, now, boys!" said he. Exactly! NOW is the time for me to complain about unwarranted intruders. It is coming to something when any Tom, Dick or Harry can barge in on my Pinheads in the manner of a spoilt schoolchild. And I'm addressing myself to you now, F.C.A. You are a stickler for terminological exactitude and in this case you get nowhere. I must ask *why* you interfered. I stated that the Editorial Board rejected an article. You tried to correct me by saying the *idea* was rejected but admit that the *article* was in fact rejected. So what? I said it was rejected because the matter was " unscientific, unreliable, and almost certainly unpractical if not impossible to use " and you corrected this to " not in accordance with scientific fact . . . . . fraught with danger." What, for Pete's sake, is the difference? Further, you have been careless enough to mention names, with the obvious inference that you and Edwards are the reliable wardens of MGA integrity and Harding and I are irresponsible. O.K. Now the Committee knows whom to sack. Basil and I are ready for the high jump. And as for you, Editor Sir, do your stuff . . . . . " This correspondence must now cease."

81. I believe I must have mentioned somewhere that mushroom growers as a class are models of originality. Forget it; I was wrong. Apparently there are few of us left. No sooner do I change my heading from " Diary " to " Pinheads " than Joseph Michaels drops his plagiarized " Diary " for a near-plagiarized " Stems and Pieces." One of the greatest alleged thinkers in our midst can work up nothing better than " I have been thinking " following directly on Atkins' " Thinking aloud." A variant of this lack of imagination appears in the 10th March, Fruit Trades' Journal where Major Dredge is shown to have copied in remarkable detail the specially designed pack of a well-known firm—even down to the colour. The idea of specially designed packs is that they should be original and individual in order to give an advantage to the firm designing them. However, we must console ourselves with the old adage: Imitation is the sincerest form of flattery.

82. The affable Luxmoore brothers here for a day. After a normal lunch at a local hostelry we all three pitched vigorously and enthusiastically into a compost to consider its condition. We were watched keenly by men working at another stack in the same shed, one of whom was reported later to have said, " We could work as fast as that if we'd had the same to drink at lunch."

ELECTING THE COMMITTEE

A SUGGESTION

from R. L. EDWARDS

At the 1954 Annual General Meeting at Tunbridge Wells I suggested that the Executive Committee should be elected by a postal vote, thus giving every member the chance of voting without requiring attendance at the A.G.M. The Editor has now kindly allowed me to discuss the subject in more detail in the Bulletin.

The present procedure, which has been followed since the Association was formed, is to invite nominations by post about a month before the A.G.M., and then for grower members present at the A.G.M. to vote on the ballot papers provided. There are several objections to this procedure, particularly as it is now practised. Last year I missed the voting, but for the two years before that less than 40 members, about 15% of those eligible, voted; stranger than this, there was no systematic check on the right of those who did vote to do so. Fantastic as it may seem, a complete stranger could have come into the meeting and voted with quite a good chance of not being challenged. I think all full grower members should be enabled to vote without attending the A.G.M. and arrangements should be made to ensure that only those who are entitled to vote can do so. For anyone in Scotland, Ireland or the Northern half of England it takes up most of two days, and costs a considerable sum in fares and hotel expenses to come to a meeting in Sussex to vote; in fact it may cost more than his annual subscription.

It is time the Executive Committee was elected by all the members who wish to vote, by a method in accordance with the dignity and importance of the Association. I therefore suggest the following arrangements. About two months before the A.G.M. a notice should go with the Bulletin to all full grower members, giving the names of the existing committee and indicating those due to retire, and inviting nominations within a fortnight. The Nominee's consent to stand for election would have to be obtained in writing and sent to the Secretary by the proposer.

When all the nominations were received a ballot paper would be printed and circulated to all grower members, probably with the next Bulletin, with a reply paid envelope marked " Ballot paper only." Members would then record their votes in the usual way, sign the envelope, and post the ballot paper in it.

The Secretary could then check the voters' envelopes as they arrived against his list of members, and keep them unopened until the closing date for voting, which might be the day of the A.G.M., when they would be opened and the votes counted by the scrutineers.

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Please forward as before your excellent White Spawn, by Air Mail at your earliest convenience.

I would like to mention we have been having excellent results with your Mount Spawn, and congratulate you on producing such a superb product.

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(Signed) C. M. HULLEY.

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January, 1956

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If this system is to be adopted the opportunity might also be taken to introduce some definite regional representation, a thing which has long been discussed. So far no definite rules have been made but an attempt has been made to include some members from as many parts of the country as possible. This has even gone to the extent of having one member from Northern Ireland, representing 8 members there, whereas the average is one for each 17.

The obvious way is to divide the country up into areas with about the same number of members in each, and to let the members in each area elect one of themselves in the same way and by the same postal ballot as for the general members.

Thus for example there could be six areas:—

1. Kent and Surrey (41 members in the last December list).
2. Sussex and Hants. (48).
3. Eastern (comprising Beds., Bucks., Middlesex, London, Herts., Hunts., Cambs., E. Anglia) (45).
4. North Eastern (Northants., Leicester, Rutland, Notts., Lincs., Yorks., Durham, Northumberland) (43).
5. Western (Berks., Oxford, Dorset, Wilts., Warwick., Staffs., Cheshire and all counties west of them, Wales) (45).
6. North Western (Scotland, N. Ireland, Isle of Man, Lancs., Cumberland, Westmoreland) (44).

Area representatives could be elected for three years, as at present, only two areas electing a member each year. General members could also be elected for three years, with three vacancies each year, forming a Committee of 15 as at present. It might also be a good thing if all members on completing their three years term of office were not eligible for re-election for one year. That is a rule in some big organisations and it helps to avoid getting into a rut, but it is a very controversial point.

If the proposals for area and general members of the Committee are adopted, a member could only be proposed for one kind of vacancy in any one year.

Whatever is done about area representation, I feel very strongly that the ballot for the Committee should be a postal one. It may have been unreasonable in the first place to expect members at an Annual Meeting to support proposals which would abolish their more favourable position, but I hope the present Committee will be broad-minded about it, and do what they think best for the Association. I do not think the membership of the Committee will change much, if at all, but it would remove any grounds for the occasional mutterings that "the MGA is run by the same old gang."

BEGINNERS' LUCK

(. . . or was it?—Ed.)

By T. G. FIGGIS

I am indeed honoured at being asked to describe my first efforts at growing. To do so gives particular pleasure as I have gained so much valuable information from MGA Bulletins and Research Association Reports published in recent years.

" Lady Luck " is a valuable ally in any venture and I am sure she is quite essential in a beginner's " first ever " crop. Nevertheless I feel she expects her friends to take full advantage of modern research experience and to do their share in providing " the little ones " with a comfortable home, good food and adequate attention.

The " house " is a small experimental one of about 1,000 cubic ft. planned to take 110 fish boxes, each of 2 sq. ft. Walls are existing brickwork which I have lined inside with $\frac{1}{2}$" insulation board laid on battens. Crumpled Alfol (aluminium foil) divides the air space between brick walls and board, and a further layer of Alfol has been " papered " on the inside face to make the house water, air and (I hope) bug proof. Incidentally it also improves the overall insulation by its high surface co-efficient. Results are good and allow a 60° room temperature in all weather conditions with about 1·1 k.w. maximum electric heating (Tubular and lamps partly on automatic control).

A small home-made fan provides positive air circulation for Peak Heat, or when the outside air temperature is not low enough to create a natural air movement in the house and an adequate " chimney draught " for the supply of fresh air. There is one controllable fresh air inlet arranged close to the heater. Extract is through an existing chimney and both openings are screened with 30 mesh stainless steel gauze.

Trays are planned in five tiers down each side of the house. They are supported on bed iron structures leaving a central gangway and a clear 2" air circulation space between trays and side walls. Ratio of free air space to crop area=3·7. As this first crop was essentially experimental, I decided to gain experience with only a half-full house—three tiers only were erected from floor level at 18" pitch. Ratio of free air space to crop area=7·9.

Compost had obviously (I thought) to be prepared by modern short methods and I am indebted to **Drs. Sinden and Hauser** for their invaluable articles in Mushroom Science I & II. I had not the heart to ask the manure supplier for less than 1 ton, so 1 ton of medium/light was duly ordered. Actually it arrived as 23 cwts. looking like fresh straw with few droppings—obviously long and very dry due to the then exceptional

summer weather. Frankly I had always planned to boost, but in the circumstances I further increased both nitrogen and phosphates, the mixture being added in layers when making the pile and on the first turn. The pile (initially about 7 ft. long and 5 ft. 6 ins. wide) was made on open ground between 3 wood stands and against permanent corrugated iron. The stands are movable but enable one to make a tidy pile with well rammed sides (firmed from above as the pile is built up).

The permanent galvanised iron and one of the stands prevents air entry from the ends thus simulating a normal pile of considerable length. Within 24 hours temperatures were about 140° F. and temperatures up to 170° F. were later recorded. The pile was turned only twice (at the 3rd and 6th day after making) and trays filled on the 10th day—it should have been the 9th but the house " papering " wasn't complete!

Despite Dr. Sinden's warnings I failed to add sufficient water on making the pile and on the 1st turn with the result that a considerable quantity had to be added on the 2nd turn. A total of 260 gals. (metered) was used on the original 23 cwt. of manure.

Peak Heat. On filling the boxes (5½" well firmed and estimated at 140/150 sq. ft. per ton) the manure seemed somewhat over-composted and had little or no smell of ammonia. In the house my fears were confirmed and overnight the manure temperature fell steadily until it was below 90° the following morning. Fortunately some plans had been made for assisting the Peak Heat and these turned out very well. Gas was run down to the house, from our kitchen, through a garden hose (unknown, I trust, to the Gas Co.!) and a milk churn on a large gas ring produced both live steam and dry heat sufficient to get everything under control again. By the following day the fan was necessary to equalise temperatures and *all* the trays reached 135-145°. After BHC Lindane smoking, partial **Lambert and Ayres** technique (see Bulletin No. 33) was added for good measure and the beds conditioned at 115° F. for about 48 hours. Owing to the dry heat from the gas ring, the humidity could not be maintained during Peak Heat and on examination afterwards it was felt that the top 1" to 2" of compost were much too dry. Fifteen gallons of water, corresponding to approx. 10% compost weight, was therefore sprayed on the boxes during the conditioning period.

Spawn Run. The trays were spawned with a Continental grain (Spawn A) and an English grain (Spawn B) and run at 75° until casing, which was done half at 14 days and half at 18 days, some with a sphagnum peat 1" to dust chalk mixture and some with a peat/chalk/sand mixture in equal proportions by volume. Forty-nine trays were cased 1½" and eight trays 1" thick. The relative humidity was kept high (95-100%) throughout the spawn run and very little fresh air given until seven days after the first casing. The fan was run for short periods daily to equalise temperatures. A light spraying was given before spawning. At no time during the spawn run, or after casing, were any foreign moulds or indicator fungi observed.

CROP SUMMARY

(provisional—house still 'in crop' with 0·16 lb. sq. ft. in 13th week)

	SPAWN A			SPAWN B		
	Top 12	Middle 11	Bottom 11	Top 9	Middle 9	Bottom row of trays 5 trays per row
First pinheads ..	28	29	30	27	28	30 } days from
First picking .. (3rd Nov.)	36	36	37	36	36	37 } spawning
First lb.	10	12	14	21*	14	15 } days from
Second lb.	29	35	36	55	56*	39 } start of
Third lb.	57	65	75	87		85 } picking
YIELD—						
4 weeks.. ..	1·91	1·79	1·49	1·26*	1·47	1.49 } pounds
8 weeks.. ..	2·92	2·68	2·40	2·09	2·02*	2.31 } per sq. ft.
12 weeks.. ..	3·75	3·61	3·34	2·95	2·74	2.98 } per sq. ft.

Mushrooms picked daily from each tray and weighed to ± 0·1 oz.

All weights are of healthy mushrooms **without** stalks.

*Hard gill 'infection' started 1st flush top row appearing later on middle row.

In his concluding article, which we hope to publish next month, Mr. Figgis will give the final crop summary and describe the management methods used in the production of this heavy crop.—Ed.

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SELFRIDGES IN MARCH (*Report on page 127*)

More "PINHEAD" Comments

By Dr. R. L. Edwards—So Stanley simulates Samuel but frowns if I follow Fred.

By Mr. W. A. B. Harding—Freedom of publication, please Mr. Editor, for the apparently fantastic notions of today may well become the standard practises of tomorrow ; who can tell where the vagaries of the fickle mushroom are concerned.

By The Editor—Yes indeed, correspondence on this particular subject must now cease.

SMALL ADVERTISEMENTS 3d. a word

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GRAVITY ROLLER CONVEYORS For Sale, 200 ft. in 8 ft. lengths in 6″ pitch, with one 90° and two 45° bends, complete with adjustable stands, very good condition, £160 ex farm. HEATHER FARM LTD., Horsell Common, Woking. (Telephone : Woking 781).

FOR SALE, Bastian and Allan Electrode Steam Boiler. 30 k.w. Excellent order. All fittings. Installed 1953. Sale due to local overload. Apply : R. DUTHY, Little Horkesley, Nr. Colchester, Ex. (Gt. Horkesley 233).

MUSHROOM FARM for disposal, 11,000 square feet. 3,500 Trays, Pinkerton Manure Turner. Ferguson Tractor with fork lift. Vertical steam boiler with pipes to pasteurising, spawning and all growing sheds. Alternative electrical heating system. The lease of an attractive six-roomed house, and two modernised cottages are available. Apply : Sir Oliver Leese, Worfield Gardens, Bridgnorth, Shropshire.

(*Continued on page 132*)

The Long and the Short of it !

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of John Ady & Co. Ltd *reports* :

SHORT COMPOSTING

(A true rapid compost)

2 lb 15⅝ oz. in 11½ weeks

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Whether you use long or short composting and whatever the routine you adopt, you will find that DARLINGTON'S MUSHROOM SPAWN will produce consistently the heaviest crops of marketable mushrooms of the highest quality. In a changing world, 100% Spawn retains its position as the best that money can buy

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MUSHROOM "WEEK" IN LONDON

In addition to their normal activities this month, the Publicity Sub-Committee arranged, through the Managing Director of Selfridges for a Mushroom Week at the great Oxford Street Store. The main object was to use this as a testing ground to help establish what techniques might be used in arranging for mushroom weeks in various centres throughout the country.

Window Display. In the case of the Selfridge " Week "— arrangements were made for one of their largest windows to be devoted entirely to Mushrooms for the week beginning 12th March. The centre of the window was occupied by the model of a modern Mushroom Farm (which many members will have seen at the MGA stand at Brighton). This was flanked on either side by trays of growing mushrooms, books of Mushroom Recipes, etc. (which were also featured in the Book Department), arrangements of our leaflet " Winning Ways with Mushrooms " and large trug baskets of Mushrooms attractively arranged on green leaves, also ½ lb. pre-packs, etc. Across the back were displayed three of the MGA's large m-m-m-Mushroom posters. This unusual window display caused great interest, to the consternation of the police who complained that the pavement was frequently becoming blocked. It certainly brought mushrooms to the minds of the tens of thousands of bus passengers, and pedestrians each day.

The Food Department contained an island site entirely devoted to a sales display of various grades of Mushrooms. (Selfridges made special arrangements with Covent Garden Market for adequate supplies). Also there were piles of our leaflets, and more trays of growing mushrooms. The leaflets displayed here and in other parts of the Store were in great demand and many thousands were taken by interested customers. A member in attendance had to disillusion one dear old lady who enquired whether the mass of chip baskets full of mushrooms, had all been picked off those few trays that morning (it would have represented 20 lb. per square foot in one flush. On *trays*, too, Mr. Middlebrook!)

Telephone Orders. The food department at Selfridges maintains a special telephone order switch board of its own with twenty telephone operators. All of these were briefed to suggest mushrooms to telephone order customers.

Our Mushroom leaflets were enclosed with Selfridges annual Easter Food List sent to 12,000 of their special food customers throughout the country.

Restaurants and Snack Bars. All the Selfridge Restaurants and Snack Bars featured two special Mushroom dishes at the top of their menus during the week.

Increased Sales. Naturally these efforts increased Selfridges sale of Mushrooms many times over, but the chief benefit to MGA was the impact made on the minds of thousands of people regardless of where they live or where they buy their mushrooms.

Fred. Atkins writes about . . . . . .

PARIS—TWO MONTHS AHEAD

Two months after you receive this Bulletin the Third International Conference on Mushroom Science opens in Paris. The lectures will be given in the Natural History Museum in the Rue Buffon.

The official opening will take place on Thursday morning, 14th June, at the National Agricultural Research Centre at Versailles, and be followed by a visit to the new Mushroom Research Station at Montesson.

Among the " ancillary attractions " are a £3 per head tour of Paris-by-night; a trip for the ladies by launch along the Seine, with tea, at 12/6d., and a free and private call at the salon of a famous dress designer; and a visit to Monsieur Dialand's wine cellar near Saumur with a wine tasting and a lunch with free wine served in the open by young ladies in local costume described to me by M. Dialand as " angévines," angels of the vine.

The Banquet which customarily closes these International Conferences will this year " be graciously offered at the restaurant *les Centraux* in the Rue Jean Goujon." It will be an unforgettable evening, I can assure you.

Three questions are being asked. The first is: **Will it be worthwhile?** The answer is unquestionably Yes. These Conferences are unique. At no other time can you meet the leading growers and research workers from all over Europe. A party of American growers is expected, and it would be valuable to exchange views with them. How is the French research programme going? Have they finally conquered their brand of Yellow Mould, as seemed likely when I was last there? And is the composting drum still revolving? I want to talk about many things with the Director of the exciting East German Institute described in our March issue. A party is coming from Moscow, I hear; how do *they* grow mushrooms?

The second question is: **What is the use if I can't speak French?** Half the delegates can speak English, there will be scores of interpreters, and the intention is to relay to individual earphones simultaneous translations of each paper. I expect half the papers will be delivered in English, anyway.

The third question is: **What will it cost?** The return fare, London to Paris, can be covered by £10; it will be even cheaper if we go as a party, by train and boat, which should be fun. If we say 25s. for bed and breakfast, our hotel will cost us £12 10s. Lunches £5. Closing Banquet free. Wine-tasting lunch £1 1s. Coach fare and lunch on opening day free. Conference fee, £4 4. The tour of growers in the Loire Valley, say £7. Dinners at night, say £10. The total is £50. It would be quite easy to make this £100, but not really necessary.

Within the next few days Winston Alderton will be sending each member a fuller itinerary and a form on which to make applications.

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THE AUTHOR OF "PINHEADS" shamelessly, and without shedding a tear is willing to shed the following excellent stock to any Tray Grower who possesses a good bank balance.

950 Trays, 3′ × 2′ × 5″ inside measurements, corner-banded, sound and strong	4/- each
16 Collis roller conveyors, 8′ long, 2¼″ dia. × 18″ wide × 6″ pitch	10/- per ft.
5 stands for same, 30″ to 48″	30/- each
10 „ „ „ 18″ to 30″	25/- „
3 „ „ „ 12″ to 18″	15/- „
2 curves of 45° for same..	£5 „
1 curve „ 90° „ „	£8 „

The above are all in first-rate condition, and no qualified valuer would dream of such low prices. £300 the lot, on site. STANLEY MIDDLEBROOK, Brayton, Selby, Yorks. Tel. Selby 114.

MUSHROOM FARM AND MODERN HATCHERY on 12 acres for Sale by Private Treaty near Dublin with extensive and well-built dry-storage. Floor area exceeds 25,000 sq. ft. and storage capacity over 330,000 cubic feet. Excellent living accommodation, offices, telephone with extensions, central heating, electric and all services. Long lease at ground rent of £1. Owners prepared to accept very reasonable price. Further details from Grews Estates Ltd., 54 Dawson Street, Dublin.

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IMPROVES MANURE SUPPLIES

● **AS A SYNTHETIC**

When horse manure is not available, wheat straw treated with Adco "M" will provide a compost for mushroom growing. Using only 140 lbs. of Adco "M" per ton of chopped straw, Mr. A. Hawkins, Hillrow, Haddenham, Cambs., at his first attempt at Mushroom Cultivation, obtained a yield of 1½ lbs. of mushrooms per square foot of bed in ten weeks over an area of 1,100 square feet. The quality of the mushrooms was excellent.

● **AS A SUPPLEMENT**

Introduced early in the composting, Adco "M" speedily brings racing stable manure to the required condition, thus shortening the time needed for composting. Higher temperatures during fermentation are reached, uniformity of the compost attained and a more rapid spawn growth induced. The cost is no more than 10s. 0d. to 12s. 6d. per ton of manure, according to the quality of the manure.

Particulars & Prices from **ADCO LTD.** HARPENDEN, HERTS

CHALK *for*

MUSHROOM CASINGS

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Published by the Mushroom Growers' Association, 45 Bedford Square, London, W.C.1
and printed by W. S. Maney & Son Ltd., Russell Street, Leeds 1